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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,686	01/20/2006	Giampiero Morini	FE 6070 (US)	4380

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Basell USA Inc.
Delaware Corporate Center II
2 Righter Parkway, Suite #300
Wilmington, DE 19803

EXAMINER	
KRYLOVA, IRINA	
ART UNIT	PAPER NUMBER
4131	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,686	MORINI ET AL.	
	Examiner	Art Unit	
	IRINA KRYLOVA	4131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08/15/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-13 and 23-27 are rejected under 35 U.S.C. 102(b) as being anticipated by **Masaki et al**, in EP 640,624.

2. Masaki et al discloses a process for producing olefin copolymers comprising butene-1, ethylene and/or propylene with high stereoregularity, where the process comprises copolymerizing the above mentioned olefins in the presence of the catalyst system, where the catalyst comprises: A) titanium, magnesium, halogen components; B) an organic aluminum compound; and C) an external donor organic silicon compound represented by the formula:

(R1O)3 – Si - C (CH3)2 CH (R2)(R3);

where R1, R2, R3 represent hydrocarbon group (page 3, lines 33-55). Component A) comprises titanium compounds on magnesium chloride and phthalates as internal donors (page 4, lines 15-55). Aluminum compound comprises an alkylaluminum compound (page 6, lines 2-30). The external donor silicon compound comprises thexyltrimethoxysilane (page 7, lines 1-23). The polymerization is carried out in liquid

monomer (page 7, lines 45-50) and in two stages under different reaction conditions (page 7, lines 48-49).

3. Masaki et al discloses the process for producing a high **stereoregular** butene-1 copolymer. **Masaki et al** do not specify the copolymer being random, having r1.r2 reactivity ratios being less than 2, or specific isotacticity value of butene-1 units in the copolymer. However, **Koshyama et al** in EP 186,287 and **Fukui et al** in JP 06206940 disclose a process for producing **random butene-1** copolymer with alpha olefin comprising polymerizing the monomers in the presence of a substantially the same catalyst comprising:

1) titanium catalyst component containing magnesium, titanium, halogen and a diester electron donor comprising phthalates;

2) an organoaluminum compound, and

3) an organic silicon compound having the following formula:

RnSi(OR1)4-n, where R are alkyl, cycloalkyl or aryl (See full translation of **Fukui et al**, JP 06206940 or page 10, lines 15-35; page 13, lines 10-30 in **Koshyama et al,** EP 186,287). As it is known in the art, a copolymer having reactivity ratio product r1.r2 less than 2 (0.6-1.5) is considered to be random (see page 19, lines 20-30 in WO 02/083754 by Datta et al). Therefore, both **Fukui et al and Koshyama et al,** EP 186,287 serve as evidence that the copolymer of **Masaki et al** inherently falls within the claimed r1.r2 range. Secondary references may be employed in anticipation rejections to establish inherency. See MPEP 2131.02.

4. **Kohyama et al** in EP 172,961 **(Kohyama et al '961)** discloses copolymers of butene-1 with 1 mole% of other olefins produced using the catalyst comprising titanium catalyst component, trialkyl aluminum compound and alkylalkoxysilane , having isotacticity value of 99% and MW distribution (Polydispersity Index) less than 6 (page 2, lines 40-65). Though **Kohyama et al '961** is silent about absence of 4,1 insertions of butene units, taking into account very high stereoregularity of butene-1 units, produced using the catalyst system mentioned above, absence of irregular 4,1 insertions would be an inherent characteristic of the butene-1 copolymer product. "Products of identical chemical composition can not have mutually exclusive properties" (See MPEP 2112.01).

5. The process employed by **Kohyama et al '961** is identical to the presently claimed process, and is identical to the process of **Masaki et al.** The copolymer of **Kohyama et al '961** results in an isotacticity content of greater than 99%. Thus, **Kohyama et al** serves as evidence that the isotacticity of **Masaki et al**. inherently falls within the claimed range. Secondary references may be employed in anticipation rejections to establish inherency. See MPEP 2131.02.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over by **Masaki et al**, in EP 640,624, as applied to claims 1-13 and 23-27 above, and further in view of **Hwo** in US 4,960,820 (**Hwo '820**) or **Collina et al** in US 6,180,720.

7. Masaki et al discloses a process for producing olefin copolymers comprising butene-1, ethylene and/or propylene with high stereoregularity, where the process comprises copolymerizing the above mentioned olefins in the presence of the catalyst system, where the catalyst comprises: A) titanium, magnesium, halogen components; B) an organic aluminum compound; and C) an external donor organic silicon compound represented by the formula:

(R1O)3 – Si - C (CH3)2 CH (R2)(R3);

where R1, R2, R3 represent hydrocarbon group (page 3, lines 33-55). Component A) comprises titanium compounds on magnesium chloride and phthalates as internal donors (page 4, lines 15-55). Aluminum compound comprises an alkylaluminum compound (page 6, lines 2-30). The external donor silicon compound comprises thexyltrimethoxysilane (page 7, lines 1-23). The polymerization is carried out in liquid monomer (page 7, lines 45-50) and in two stages under different reaction conditions (page 7, lines 48-49). **Masaki et al** does not specify the use of the butene-1 – propylene copolymer in a blend with another polymer.

8. Hwo '820 discloses a blend of 1) 10% by weight of copolymer of butene-1 with 1-30% of another alpha olefin, wherein butene-1 units having 98% isotactic portions, and

2) 90% of propylene copolymer having 1-30% mol of another alpha olefin comonomer (col. 2, lines 32-65). The comonomer comprises ethylene or butene (col. 3, lines 30-32). Since **Hwo '820** discloses a copolymer of butene-1 with 1-30% of another alpha olefin similar to the copolymer of **Masaki et al**, it would be obvious to one skilled in the art at the time of the invention has been made, to use the butene copolymer of **Masaki et al** in the blend of **Hwo '820.**

9. Collina et al discloses a polyolefin mixture comprising 1) 3-25% of crystalline isotactic copolymers of butene-1 with 0.5-30% of an olefinic comonomer selected from ethylene and propylene; and 2) 75-97% by weight of polyolefin composition comprising a crystalline polypropylene and a copolymer of ethylene and propylene and/or an alpha olefin (Abstract, col. 8, lines 51-55).

10. Since **Collina et al**. recites the use of crystalline isotactic copolymers of butene-1, produced using similar catalyst system as was discussed in **Masaki et al**, it would be obvious to one skilled in the art at the time of the invention was made, to use the butene-1 copolymer of **Masaki et al** in the blend of **Collina et al**.

11. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over by **Masaki et al**, in EP 640,624 as applied to claims 1-13 above, and further in view of **Hwo** in 4,882,229 (**Hwo '229**).

12. Masaki et al discloses a process for producing olefin copolymers comprising butene-1, ethylene and/or propylene with high stereoregularity, where the process

comprises copolymerizing the above mentioned olefins in the presence of the catalyst system, where the catalyst comprises: A) titanium, magnesium, halogen components; B) an organic aluminum compound; and C) an external donor organic silicon compound represented by the formula:

(R1O)3 – Si - C (CH3)2 CH (R2)(R3);

where R1, R2, R3 represent hydrocarbon group (page 3, lines 33-55). Component A) comprises titanium compounds on magnesium chloride and phthalates as internal donors (page 4, lines 15-55). Aluminum compound comprises an alkylaluminum compound (page 6, lines 2-30). The external donor silicon compound comprises thexyltrimethoxysilane (page 7, lines 1-23). The polymerization is carried out in liquid monomer (page 7, lines 45-50) and in two stages under different reaction conditions (page 7, lines 48-49). **Masaki et al** does not specify the use of the butene-1 – propylene copolymer in a blend with another polymer.

13. **Hwo '229** discloses a blend of 1) 8-49% by weight of butene-1 copolymer having isotactic portions of at least 98%; and 2) 51-92% of polyethylene (Abstract, col. 3, lines 15-50).

14. Since **Hwo'229** discloses the use of a butene copolymer having isotactic portions of at least 98% which is very similar to the copolymer of **Masaki et al**, it would be obvious to one skilled in the art at the time of the invention was made, to use the butene-1 copolymer of **Masaki et al** in the blend of **Hwo'229.**

15. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over by **Masaki et al** in EP 640,624 as applied to claims 1-13 above, and further in view of **Hwo** in US 4,960,820 (**Hwo '820**) and **Hughes** in US 4,316,970.

16. Masaki et al discloses a process for producing olefin copolymers comprising butene-1, ethylene and/or propylene with high stereoregularity, where the process comprises copolymerizing the above mentioned olefins in the presence of the catalyst system, where the catalyst comprises: A) titanium, magnesium, halogen components; B) an organic aluminum compound; and C) an external donor organic silicon compound.

17. Hwo '820 discloses an isotactic copolymer of butene-1 and 1-30% mole ethylene, having 98% by weight of isotactic portions (Col. 2, lines 60; col. 3, lines 5-10). The copolymer is produced using Ziegler-Natta catalysts (col. 3, lines 10-15).

18. Hughes discloses an isotactic butene-1-ethylene copolymer containing 0.5-10% mole of ethylene and having at least 98% by weight of isotactic portions.

19. Since copolymers of **Hwo '820** and **Hughes** are both isotactic, having 98% and more of isotactic portions, and were produced using similar catalyst system as **Masaki et al**, therefore, using the reasoning given above, one skilled in the art can assume that the copolymers of **Hwo '820** and **Hughes** are substantially random (i.e. r1.r2 is less than 2) and have no irregular 4,-insertions.

20. Both **Hwo' 820** and **Hughes** recite copolymers of butene-1 with different amounts of ethylene copolymer. As it is well known in the art, crystallinity and thus melting point of the (co)polymer, depend on the amount of ethylene comonomer in the polymer. Larger amount of ethylene comonomer will result in the copolymer being more

amorphous and having lower melting point. Thus, by varying the amount of ethylene between 1 and 30% mole, one skilled in the art can produce the butene-1 copolymer with expected crystallinity and melting point. In addition, random isotactic butene-1 – ethylene copolymers with specific amount of ethylene units will have the same properties, which become inherent characteristics of the product. "Products of identical chemical composition can not have mutually exclusive properties" (See MPEP 2112.01).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IRINA KRYLOVA whose telephone number is (571)270-7349. The examiner can normally be reached on Monday-Friday 6:30am-4pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner, Art Unit 4131

/I. K./
Examiner, Art Unit 4131